

WHAT WE CLAIM IS:

1. A pressure sensor comprising
5 a substrate with an opening; and

a flexible diaphragm held across the opening of the substrate

wherein at temperatures of at least about 200 °C, the pressure sensor has a gage factor of
10 at least about 27.
2. The pressure sensor in claim 1, wherein the pressure sensor has a gage factor of at least about 32.
- 15 3. The pressure sensor in claim 1, wherein the pressure sensor has a gage factor of at least about 37.
4. The pressure sensor in claim 1, wherein at temperatures of at least about 400 °C, the pressure sensor has a gage factor of at least about 22.
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5. The pressure sensor in claim 4, wherein the pressure sensor has a gage factor of at least about 30.
6. The pressure sensor in claim 4, wherein the pressure sensor has a gage factor of at
25 least about 35.
7. The pressure sensor in claim 1, wherein at temperatures of at least about 550 °C, the pressure sensor has a gage factor of at least about 16.

8. The pressure sensor in claim 7, wherein the pressure sensor has a gage factor of at least about 25.

9. The pressure sensor in claim 7, wherein the pressure sensor has a gage factor of at least about 35.

10. A pressure sensor comprising

a sensing element; and

a heating element capable of heating the sensing element to at least about the application temperature of the pressure sensor.

11. The pressure sensor in claim 10, wherein the sensing element is a strain gage.

12. The pressure sensor in claim 10, wherein the heating element is capable of heating the sensing element to at least about the maximum application temperature of the pressure sensor.

13. The pressure sensor in claim 10, wherein the sensing element is made from a shape memory alloy material.

14. The pressure sensor in claim 10, wherein the heating element heats the sensing element to over 200 °C.

15. The pressure sensor in claim 11, wherein the strain gage responds to deflection of a diaphragm.

16. A pressure sensor comprising

a substrate with an opening having a maximum cross-sectional dimension of less than about 1.0 mm; and

a flexible diaphragm.

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17. The pressure sensor in claim 16, wherein the opening in the substrate has a maximum cross-sectional dimension of less than about 0.25 mm.

18. The pressure sensor in claim 16, wherein the flexible diaphragm has a thickness of
10 less than 350 um extending across the opening of the substrate.

19. The pressure sensor in claim 18, wherein the pressure sensor is capable of measuring pressures of greater than 1000 psi without premature failure.

15 20. The pressure sensor in claim 16, wherein the sensing element is made from a shape memory alloy material.